

Trend Study 16C-3-97

Study site name: North Manti Face .

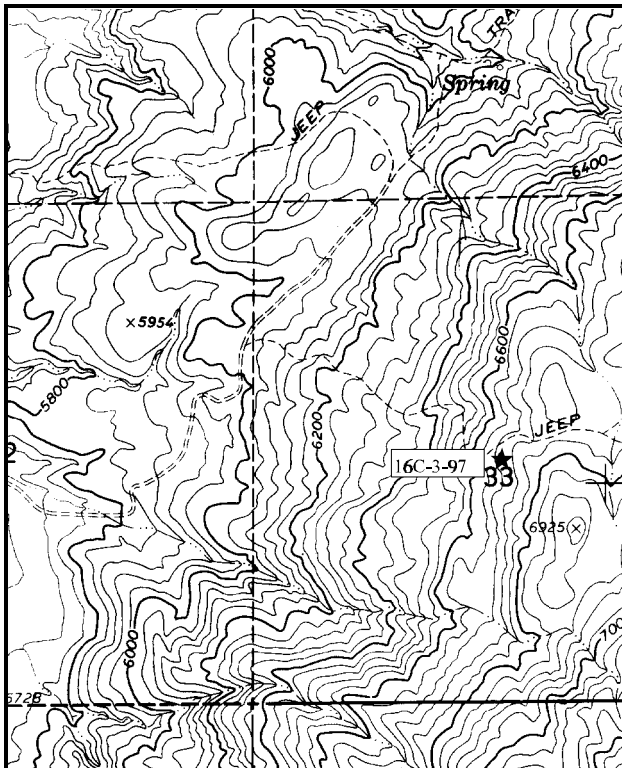
Range type: Big Sagebrush - Grass

Compass bearing: frequency baseline 180M degrees. (Line 3-4 150°M)

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

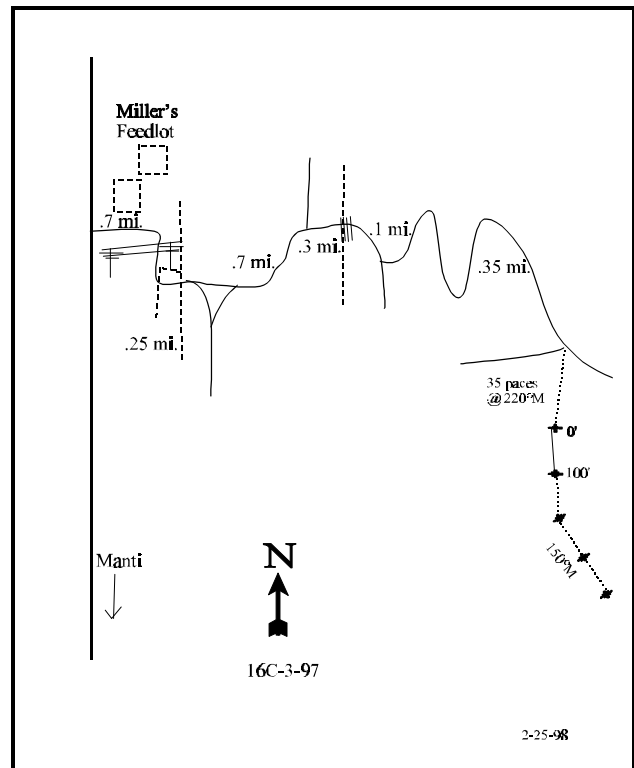
LOCATION DESCRIPTION

From the Manti temple visitors' center in Manti, proceed north on 89 for 1.5 miles. Just south of Miller's feedlot turn east on a dirt road (Miller's Lane) and go 0.7 miles to a gate. Proceed down the road another 0.25 miles to a fence. Continue on 0.7 miles to a fork in the road, go right. At 0.3 miles past the fork you'll cross a cattle guard onto DWR property. 0.1 miles further on you'll come to another fork in the road. Stay left here switchbacking up the mountain for 0.35 miles to another fork. Stop here and walk 35 paces at 220°M to the O-foot baseline stake, which is marked by browse tag #9044.



Map Name: Ephraim .

Township 17S, Range 3E, Section 33



Diagrammatic Sketch

UTM 4349220.478 N, 449399.208 E

DISCUSSION

Trend Study No. 16C-3 (29-3)

The North Manti Face trend study samples a mountain big sagebrush range type with a substantial amount of preferred mountain brush species along with a significant amount of juniper (contributes 60% of the browse cover). Like many of the trend studies in Management Unit 16, it is located on Division land. The area is important winter range for elk and especially deer which had a pellet-group quadrat frequency of 67%. There is excellent protective cover on and around the site. Parts of the area have been terraced, yet it supports chiefly native vegetation. The site has a west aspect with a steep slope of 40%. The elevation is 6,760 feet.

The SCS classifies the soil as somewhat excessively drained, very cobbly loam in the Fontreen series. It is moderately deep, but may be restricted by rocks below 36 inches. Fifty-eight percent of the vegetative cover is provided by herbaceous species which is very important to soil protection on the steep slopes. The amount of litter cover on the site is moderately low at about 23% to 26%. A majority of the surface was occupied by pavement (41%) and rock (18%) in 1989, a high amount, yet common for this easily eroded soil. Currently, cover for pavement (30%) and rock (11%) are reduced. Originally, sheet erosion was active and there were numerous rills and small gullies. Now it appears that erosion is minimal.

The key browse species is mountain big sagebrush. In 1989, the heavily hedged growth form was evident on the majority of the population, with 93% of the mature population showing heavy use. Now heavy use is apparent on only about 36% of the population. Density plot data from 1989 indicated a moderately dense population of 2,865 plants/acre. With the new sampling design which greatly increases the sample size, the density is now estimated at only 1,000 plants/acre. The change in density is mostly from the much larger sample size giving a more accurate population estimate, because the number of dead plants cannot explain the losses to the population. The percentage of the population that is classified as mature has remained fairly stable (58% to 52%). Percent decadence has also remained quite stable (37% to 36%). This is not excessive, for many of the state's sagebrush populations have percent decadency rates near or higher than this. No seedlings have been sampled at any time, but the percentage of young plants in the population has gone from 5% to 12%. This would be adequate to maintain the population, but this would not be enough to increase its density. Other palatable browse species on the site includes squaw-apple, white rubber rabbitbrush, four-wing saltbush, serviceberry, and snowberry. Most of these have been moderately to heavily browsed. The junipers show evidence of high lining. A zone of oakbrush occurs nearby, east and upslope of the study site. Broom snakeweed makes up only about 2% of the browse cover at this time and its density has shown a significant decrease to about 2,520 plants/acre.

The stand of bluebunch wheatgrass is an important soil stabilization factor on this slope providing 89% of the grass cover and 60% of the herbaceous cover. It has a quadrat frequency of almost 100%. Fifty-eight percent of the plant cover is contributed by the herbaceous understory, which helps most in mitigating the effects of high intensity summer rainfall. Forb cover is average for a sagebrush-juniper site with a moderately high diversity of species (29 species in 1997). The forb species contributing the most cover is Kings sandwort and rock goldenrod which together contribute to almost 50% of the forb cover.

1989 APPARENT TREND ASSESSMENT

With the important but variable ground cover provided by the bunch grasses on this steep and erodible slope, soil loss appears to continue. Soil trend seems to be on the down side. The vegetative trend is stable in terms of species diversity and age class distributions. The abundance of snakeweed is not necessarily an indication of a downward trend.

1997 TREND ASSESSMENT

There have been some changes in the characteristics of the ground cover. Combined cover value for rock and pavement has decreased from almost 60% down to about 40%. With the increase in percent bare soil, this would probably indicate that some soil has covered some of the surface rock. Percent litter has increased slightly, but percent bare soil has increased from 5% to 8%. The ratio of protective cover (vegetation and litter cover) with percent bare soil is good at 3.25:1, but the slope is steep at 40%. Soil trend would be considered to be stable to slightly down at this time. The browse trend would be considered slightly down for the sagebrush component, which makes up 29% of the browse cover. The next highest preferred browse only makes up 3% of the browse cover. Obviously, sagebrush makes up the majority of the preferred winter browse on this site, yet its density is only about 1,000 plants/acre. As explained earlier, most of the downward population estimate is more reflective of the greatly improved sampling design, not actual losses. Juniper makes up 60% of the browse cover. This kind of detrimental competition is going to have an adverse effect on the sagebrush population. Browse trend is down even though heavy use has gone down significantly from 93% to 36%, yet those classified with poor vigor has increased from 2% to 18%. Percent decadency is still moderately high at 36%. The trend for perennial herbaceous species is slightly down with sum of nested frequency for grasses and forbs both showing slightly downward trends.

TREND ASSESSMENT

soil - stable to slightly down

browse - slightly down for sagebrush

herbaceous understory - slightly down for perennial grasses and forbs

HERBACEOUS TRENDS --

Herd unit 16C , Study no: 3

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover % '97
		'89	'97	'89	'97	
G	Agropyron spicatum	287	268	98	96	10.96
G	Bromus japonicus (a)	-	42	-	13	.16
G	Bromus tectorum (a)	-	35	-	15	.15
G	Oryzopsis hymenoides	-	1	-	1	.03
G	Poa fendleriana	60	*23	26	10	.15
G	Poa secunda	105	*137	47	56	.85
Total for Grasses		452	506	171	191	12.31
F	Alyssum alyssoides (a)	-	8	-	3	.01
F	Antennaria rosea	-	3	-	1	.00

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover % '97
		'89	'97	'89	'97	
F	Arabis spp.	-	3	-	1	.00
F	Arenaria kingii	-	*111	-	43	1.11
F	Astragalus megacarpus	24	20	10	9	.27
F	Astragalus utahensis	-	7	-	3	.01
F	Camelina microcarpa (a)	-	9	-	4	.02
F	Calochortus nuttallii	-	4	-	2	.01
F	Cirsium spp.	18	*5	12	3	.06
F	Crepis acuminata	12	6	6	4	.02
F	Cryptantha spp.	16	*4	7	1	.03
F	Cymopterus spp.	-	1	-	1	.00
F	Descurainia pinnata (a)	-	4	-	1	.03
F	Erigeron spp.	-	4	-	2	.04
F	Eriogonum jamesii	13	13	5	5	.36
F	Eriogonum umbellatum	-	2	-	1	.03
F	Haplopappus acaulis	6	3	2	1	.15
F	Helianthus annuus (a)	1	-	1	-	-
F	Lappula occidentalis (a)	-	2	-	1	.00
F	Leucelene ericoides	21	41	7	14	.98
F	Penstemon spp.	50	*11	23	5	.10
F	Petradoria pumila	46	47	16	22	1.78
F	Phlox hoodii canescens	182	*29	68	13	.14
F	Phlox longifolia	10	18	4	7	.06
F	Ranunculus testiculatus (a)	-	160	-	56	.62
F	Streptanthus cordatus	-	1	-	1	.00
F	Tragopogon dubius	1	-	1	-	-
F	Vicia americana	-	3	-	1	.03
Total for Forbs		400	519	162	205	5.91

* Indicates significant difference at $\alpha = 0.10$ (annuals excluded)

BROWSE TRENDS --

Herd unit 16C , Study no: 3

T y p e	Species	Strip Frequency '97	Average Cover % '97
B	Amelanchier utahensis	1	.00
B	Artemisia nova	2	-
B	Artemisia tridentata vaseyana	37	3.92
B	Atriplex canescens	2	.15
B	Chrysothamnus depressus	17	.54
B	Chrysothamnus nauseosus consimilis	5	.09
B	Chrysothamnus viscidiflorus viscidiflorus	4	.01
B	Gutierrezia sarothrae	37	.25
B	Juniperus osteosperma	5	8.07
B	Peraphyllum ramosissimum	1	.38
B	Symphoricarpos oreophilus	1	.00
Total for Browse		112	13.45

BASIC COVER --

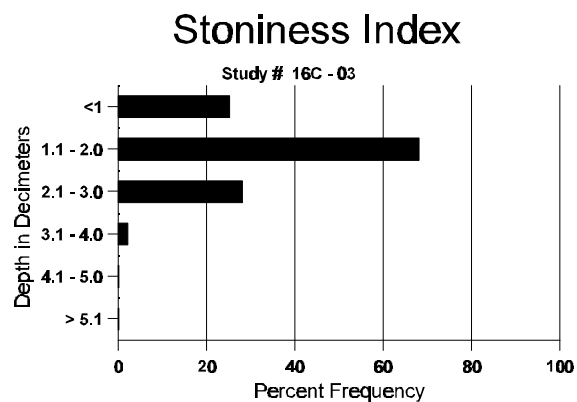
Herd unit 16C , Study no: 3

Cover Type	Nested Frequency '97	Average Cover % '89 '97	
Vegetation	341	13.00	31.28
Rock	287	18.00	10.76
Pavement	345	41.25	30.36
Litter	381	23.00	25.97
Cryptogams	96	0	.58
Bare Ground	222	4.75	8.14

SOIL ANALYSIS DATA --

Herd Unit 16C, Study no: 03

Effective rooting depth (inches)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
8.7	56.4 (13.5)	7.4	32.0	27.4	40.6	7.4	9.4	201.6	.5



PELLET GROUP FREQUENCY --

Herd unit 16C , Study no: 3

Type	Quadrat Frequency '97
Rabbit	18
Elk	6
Deer	67

BROWSE CHARACTERISTICS --

Herd unit 16C , Study no: 3

A Y G R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
	1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier utahensis																	
M	89	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	1	-	-	-	-	-	-	1	-	-	-	20	21	37
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'89		00%			00%			00%			Appeared						
'97		00%			100%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'89	0	Dec:	-		
												'97	20		-		

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia nova																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	1	-	-	-	-	-	-	-	2	-	-	-	40	12	33	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'89		00%			00%			00%			Appeared							
'97		50%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'89	0	Dec:	-			
												'97	40		-			
Artemisia tridentata vaseyana																		
Y	89	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	97	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
M	89	-	1	24	-	-	-	-	-	-	25	-	-	-	1666	23	27	25
	97	2	12	12	-	-	-	-	-	-	26	-	-	-	520	21	33	26
D	89	-	-	16	-	-	-	-	-	-	15	-	-	1	1066			16
	97	3	9	6	-	-	-	-	-	-	9	-	-	9	360			18
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'89		02%			93%			02%			-65%							
'97		42%			36%			18%										
Total Plants/Acre (excluding Dead & Seedlings)												'89	2865	Dec:	37%			
												'97	1000		36%			
Atriplex canescens																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	2	-	-	-	-	-	-	-	2	-	-	-	40	38	38	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'89		00%			00%			00%			Appeared							
'97		100%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'89	0	Dec:	-			
												'97	40		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus depressus																		
Y	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66	3	6	
	97	24	13	-	-	2	-	-	-	-	39	-	-	-	780	15	11	
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	2	1	-	-	-	-	-	-	3	-	-	-	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'89			00%			00%			+85%							
		'97			40%			02%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'89	132	Dec:	0%			
												'97	860		7%			
Chrysothamnus nauseosus consimilis																		
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	89	-	1	1	-	-	-	-	-	-	1	1	-	-	133	19	14	
	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60	32	39	
D	89	-	-	1	-	-	-	-	-	-	1	-	-	-	66		1	
	97	-	1	-	-	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'89			33%			67%			-40%							
		'97			17%			00%			17%							
Total Plants/Acre (excluding Dead & Seedlings)												'89	199	Dec:	33%			
												'97	120		17%			
Chrysothamnus viscidiflorus viscidiflorus																		
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60	9	11	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'89			00%			00%			Appeared							
		'97			00%			00%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'89	0	Dec:	-			
												'97	140		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	97	6	-	-	2	-	-	-	-	-	8	-	-	-	160		8	
Y	89	7	-	-	-	-	-	-	-	-	7	-	-	-	466		7	
	97	80	-	-	-	-	-	-	-	-	80	-	-	-	1600		80	
M	89	40	-	-	-	-	-	-	-	-	40	-	-	-	2666	7 7	40	
	97	45	-	-	-	-	-	-	-	-	45	-	-	-	900	9 9	45	
D	89	6	-	-	-	-	-	-	-	-	3	-	-	3	400		6	
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'89		00%			00%			06%			-29%							
'97		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'89	3532	Dec:	11%			
												'97	2520		1%			
Juniperus osteosperma																		
S	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	89	-	1	-	-	-	-	-	-	-	1	-	-	-	66	79 98	1	
	97	4	-	-	-	-	-	1	-	-	5	-	-	-	100	- -	5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'89		100%			00%			00%			+34%							
'97		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'89	66	Dec:	-			
												'97	100		-			
Peraphyllum ramosissimum																		
Y	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	89	-	-	4	-	-	-	-	-	-	4	-	-	-	266	24 16	4	
	97	-	-	-	-	-	-	-	-	1	1	-	-	-	20	18 29	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'89		00%			80%			00%			-94%							
'97		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'89	332	Dec:	-			
												'97	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4	5	6	7	8	9	1	2	3	4						
Symphoricarpos oreophilus																				
M	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0		
	'97	-	-	1	-	-	-	-	-	-	1	-	-	-	20	6	15	1		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>									
		'89			00%			00%			00%			Appeared						
		'97			00%			100%			00%									
Total Plants/Acre (excluding Dead & Seedlings)														'89	0	Dec:	-			
														'97	20		-			